

WHAT IS CLAIMED IS:

1. A method of producing a tissue product comprising:
depositing an aqueous suspension of paper making fibers onto a
forming fabric to form a wet web;
5 dewatering the wet web to a consistency of from about 30% to about
70%;
conveying the de-watered web in between opposing fabrics;
deflecting the de-watered web multiple times in between the
opposing fabrics such that the web is deflected at least three times; and
10 thereafter, drying the web to a final dryness.
2. A method as defined in Claim 1, wherein the wet web is dewatered to
a consistency from about 40% to about 60%.
3. A method as defined in Claim 1, wherein the final dried web has a
basis weight of from about 6 gsm to about 120 gsm.
- 15 4. A method as defined in Claim 1, further comprising the step of
winding the dried web into a roll.
5. A method as defined in Claim 4, wherein the wound web has a bulk
of at least 10 cc/g.
- 20 6. A method as defined in Claim 1, wherein the web is dried to a final
dryness by transferring the web to a drying cylinder and creping the web from the
cylinder.
7. A method as defined in Claim 6, wherein an adhesive material is
applied to the web for adhering the web to the drying cylinder.
8. A method as defined in Claim 1, wherein the web is deflected by
25 pneumatic pressure.
9. A method as defined in Claim 8, wherein the pneumatic pressure is
in an amount sufficient to mold the dewatered web to at least one of the fabrics.
10. A method as defined in Claim 8, wherein the pneumatic pressure is
in an amount from about 5 inches of Hg to about 20 inches of Hg.
- 30 11. A method as defined in Claim 1, wherein the web is dewatered by
being fed through a nip defined by a pair of opposing press rolls.
12. A method as defined in Claim 1, wherein the web is dewatered by
being fed through a through-air dryer.

13. A method as defined in Claim 1, wherein the web is dried to a final dryness without the web undergoing a rush transfer process.

14. A method as defined in Claim 1, wherein the dewatered web is deflected multiple times along a deflection roll.

5 15. A method as defined in Claim 14, wherein the deflection roll includes alternating suction zones and pressurized zones for deflecting the web in between the opposing fabrics.

16. A method as defined in Claim 1, wherein the tissue web is formed without through-air drying the web.

10 17. A method as defined in Claim 14, wherein the deflection roll includes at least one gas emitting zone and at least one gas receiving zone, the gas emitting zone emitting a gas sufficient to deflect the web against one of the opposing fabrics, the gas receiving zone receiving a gas flow at a rate sufficient to deflect the web against the other opposing fabrics.

15 18. A method as defined in Claim 14, wherein one of the opposing fabrics comprises a fabric sleeve wrapped around the deflection roll.

19. A tissue web made according to the process of claim 1, in which the tissue web has a bulk of at least about 8 cc/g.

20. A method of producing a tissue web comprising:

20 conveying a tissue web around a deflection roll, the tissue web having a consistency of less than about 70%, the web being located between a first transfer fabric and a second transfer fabric when traveling around the roll, the deflection roll including at least one gas receiving zone and at least one gas emitting zone, the tissue web being deflected against the first transfer fabric and
25 against the second transfer fabric when conveyed around the deflection roll; and thereafter drying the web to a final dryness.

21. A method as defined in Claim 20, wherein the tissue web is formed from an aqueous suspension of papermaking fibers.

22. A method as defined in Claim 21, wherein the tissue web is partially
30 dewatered prior to being conveyed around the deflection roll.

23. A method as defined in Claim 22, wherein the tissue web has a consistency of from about 40% to about 60% when conveyed around the deflection roll.

24. A method as defined in Claim 22, wherein the tissue web is dewatered by being fed through a nip defined by a pair of opposing press rolls.

25. A method as defined in Claim 22, wherein the web is dewatered by being fed through a through-air dryer.

5 26. A method as defined in Claim 20, wherein the first transfer fabric and the second transfer fabric are wrapped around the deflection roll at least 30 degrees.

27. A method as defined in Claim 20, wherein the second transfer fabric comprises a fabric sleeve wrapped around the deflection roll.

10 28. A method as defined in Claim 27, wherein the tissue web is molded against the second transfer fabric when passed over the gas receiving zone, and wherein the tissue web is molded against the first transfer fabric when passed over the gas emitting zone.

15 29. A method as defined in Claim 20, wherein the deflection roll includes at least two gas receiving zones, the gas emitting zone being located in between the two gas receiving zones.

30. A method as define in Claim 20, wherein the deflection roll includes at least two gas emitting zones, the gas receiving zone being positioned in between the two gas emitting zones.

20 31. A method as defined in Claim 20, wherein the web is dried to a final dryness by transferring the web to a drying cylinder and creping the web from the cylinder.

32. A method as defined in Claim 20, wherein the final dried web has a basis weight from about 6 gsm to about 45 gsm.

25 33. A method as defined in Claim 20, wherein the tissue web is deflected against the first transfer fabric and against the second transfer fabric with a force sufficient to mold the tissue web against the fabrics.

34. A deflection roll for deflecting a tissue web during formation of the web comprising:

30 a turning roll defining an exterior surface;
a fabric sleeve wrapped around the exterior surface of the turning roll, the fabric sleeve for supporting a tissue web thereon;

at least one gas receiving zone located on the turning roll, the gas receiving zone for creating a force against a first portion of the fabric sleeve;

at least one gas emitting zone located on the turning roll, the gas emitting zone being configured to emit a pressurized gas through a second portion of the fabric sleeve; and

wherein the deflection roll is configured to receive a tissue web in between the fabric sleeve and a transfer fabric, the tissue web being deflected against the fabric sleeve when passing over the gas receiving zone and being deflected against the transfer fabric when passing over the gas emitting zone.

35. A deflection roll as defined in Claim 34, wherein the gas emitting zone is adjacent to the gas receiving zone.

36. A deflection roll as defined in Claim 34, wherein the deflection roll includes at least two gas receiving zones, the gas emitting zone being located in between the two gas receiving zones.

37. A deflection roll as defined in Claim 34, wherein the deflection roll includes at least two gas emitting zones, the gas receiving zone being positioned in between the two gas emitting zones.

38. A deflection roll as defined in Claim 34, further comprising a hood and a pressurized gas source, the pressurized gas source being configured to emit a gas through the gas emitting zone, the hood being in fluid communication with the gas emitting zone, the hood being configured to receive the gas from the gas emitting zone and to redirect the gas back through the gas receiving zone.

39. A deflection roll as defined in Claim 38, further comprising an exhaust for exhausting gas from the gas receiving zone.

40. A deflection roll as defined in Claim 38, wherein the deflection roll further includes a second gas emitting zone, the second gas emitting zone being in fluid communication with the gas receiving zone, wherein a gas flowing through the gas receiving zone is directed out through the second gas emitting zone.

41. A deflection roll as defined in Claim 34, further comprising a vacuum source, the vacuum source being in fluid communication with the gas receiving zone for creating a suction force within the gas receiving zone thereby forming a gas flow there-through, the gas receiving zone being in fluid communication with

the gas emitting zone, the gas flow created by the suction source being directed out through the gas emitting zone.

42. A deflection roll as defined in Claim 41, further comprising a hood surrounding at least a portion of the deflection roll and being in fluid communication with the gas emitting zone, the deflection roll further comprising a second gas receiving zone in fluid communication with the hood, wherein the gas flow being emitted from the gas emitting zone is redirected by the hood into the second gas receiving zone.

43. A process for modifying an existing tissue making line comprising:
providing a tissue making line including a head box configured to emit an aqueous suspension of papermaking fibers onto a forming fabric for forming a tissue web, the forming fabric being in communication with at least one transfer fabric, the transfer fabric for receiving the tissue web from the forming fabric, the tissue making line further including a dryer for drying the tissue web to a final dryness and a reel for winding the dried web into a roll;

providing a dewatering device for dewatering a formed tissue web to a consistency of from about 70% to about 30%;

providing a second transfer fabric that overlaps the first transfer fabric; and

providing a deflection device positioned adjacent to the overlapping transfer fabrics, the deflection device deflecting the dewatered web multiple times in between the first transfer fabric and the second transfer fabric such that the web undergoes at least three deflections.

44. A process as defined in Claim 43, wherein the dewatering device dewateres the formed tissue web to a consistency of from about 40% to about 60%.

45. A process as defined in Claim 43, wherein the dryer includes a drying cylinder in communication with a creping blade, the tissue web traveling over the drying cylinder and being creped from the cylinder by the creping blade.

46. A process as defined in Claim 43, wherein the deflection device deflects the tissue web in between the first and second transfer fabrics using pneumatic pressure.

47. A process as defined in Claim 43, wherein the deflection device includes a plurality of suction devices, at least one suction device being positioned

against the first transfer fabric and at least one suction device being positioned against the second transfer fabric.

5 48. A process as defined in Claim 43, wherein the deflection device includes a plurality of gas emitting devices, at least one gas emitting device being positioned against the first transfer fabric and at least one gas emitting device being positioned against the second transfer fabric.

49. A process as defined in Claim 43, wherein the deflection device includes at least one suction device and at least one gas emitting device.

10 50. A process as defined in Claim 43, wherein the dewatering device includes a nip defined by a pair of opposing press rolls.

51. A process as defined in Claim 43, wherein the deflection device comprises a deflection roll, the first and second transfer fabrics being wrapped around the deflection roll at least 30 degrees.

15 52. A process as defined in Claim 51, wherein the deflection roll includes at least one gas receiving zone and at least one gas emitting zone for transferring the tissue web in between the first transfer fabric and the second transfer fabric.

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